

# Background report for the Adelaide Coastal Water Quality Improvement Plan

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## Report 2      Draft water quality objectives

Information in the following table was prepared with input from Eco Management Services Pty Ltd

<b>PORT WATERWAYS</b>		
<b>PORT RIVER Section (Zone 4 on Part A, Figure 1)</b>		
<b>NUTRIENTS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for nutrients</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>• high nutrient concentrations and algal blooms (occasionally toxic)</li> <li>• accumulation of toxins in shellfish</li> <li>• low oxygen conditions (contributor through plant respiration—diurnal rhythm)</li> <li>• occasional fish kills</li> <li>• high ammonia levels and ammonia toxicity</li> <li>• discolouration</li> <li>• odours from decaying algae</li> </ul>	<p><b>Ambient concentration objectives:</b></p> <p>Chlorophyll ‘a’</p> <ul style="list-style-type: none"> <li>• 1 ug/L (90 percentile)</li> </ul> <p>Phosphorus</p> <ul style="list-style-type: none"> <li>• Total 25 ug/L (90 percentile)</li> <li>• FRP 10 ug/L (90 percentile)</li> </ul> <p>Nitrogen</p> <ul style="list-style-type: none"> <li>• Total N 250 ug/L (90 percentile)</li> <li>• Nitrate and Nitrate N 5 ug/L (90 percentile)</li> <li>• Ammonia N 10 ug/L (90 percentile)</li> </ul> <p>These are defined as interim objectives, based on the results of modelling undertaken as part of the Port Waterways Water Quality Improvement Plan (PWWQIP). Although modified from its former natural condition, low nutrient levels are still required to reduce or prevent algal blooms and protect existing environmental values.</p> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur, for example, for short periods following larger rainfall events or ship movement re-suspending sediments.</p>	<ul style="list-style-type: none"> <li>• reduced frequency, extent and duration of algal blooms</li> <li>• ammonia concentrations largely reduced, below 200 ug/L</li> <li>• minimal or no odours from decaying algae</li> </ul>

PHYSICAL PARAMETERS		
Water quality issues—pollutant indicators	Water quality objectives for physical parameters	WQIP performance indicators
<p>Occasionally very high loads of suspended solids occur as a result of storm events, through turbulence, riverine inputs and stormwater inputs, resulting in:</p> <ul style="list-style-type: none"> <li>• direct effects on biota (abrasion, smothering, loss of visibility, etc)</li> <li>• transport mechanism for toxicants and nutrients.</li> </ul> <p>Increased turbidity and colour (coloured dissolved organic matter) affecting:</p> <ul style="list-style-type: none"> <li>• reduction in light penetration and photosynthesis</li> <li>• recreational amenity and the suitability of waters for direct contact.</li> </ul>	<p><b>Ambient concentration objectives:</b></p> <p>Suspended solids</p> <ul style="list-style-type: none"> <li>• &lt;3 mg/L (90 percentile)</li> </ul> <p>Turbidity</p> <ul style="list-style-type: none"> <li>• &lt;1 NTU &gt;200 metres offshore (90 percentile)</li> </ul> <p>Colour</p> <ul style="list-style-type: none"> <li>• &lt;15 Hazen Units (90 percentile)</li> </ul> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur, for example, for short periods following larger rainfall events or ship movement re-suspending sediments.</p> <p>Dissolved Oxygen</p> <ul style="list-style-type: none"> <li>• &gt;6 mg/L or 100% saturation during daytime monitoring. During neap tides in summer &gt;25% minimum saturation at any time over a 24-hour diurnal cycle</li> </ul> <p>Temperature &lt; 2<sup>o</sup> over normal seasonal range</p> <ul style="list-style-type: none"> <li>• pH between 7.5–8.5</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

METALS		
Water quality issues—pollutant indicators	Water quality objectives for metals	WQIP performance indicators
<p>Metals occur in stormwater and industrial discharges. There is also the potential for remobilisation from sediments. As a consequence, concentrations in the water column can be elevated with:</p> <ul style="list-style-type: none"> <li>• the potential for sub-lethal or lethal effects on biota</li> <li>• the potential for bio-concentration, bio-accumulation and bio-magnification</li> <li>• the potential to affect safety of fish and shellfish for human consumption</li> <li>• over time, increases in sediment concentrations as most metals are associated with particulate matter, which then may be remobilised.</li> </ul> <p>Of the metals examined (Cu, Pb, Zn, Cd and Al), concentrations of copper and zinc are above the guideline trigger values.</p>	<p><b>Ambient concentration objectives (95% level of protection):</b></p> <p>Copper</p> <ul style="list-style-type: none"> <li>• 0.0013 mg/L (90 percentile)</li> </ul> <p>Lead</p> <ul style="list-style-type: none"> <li>• 0.0044 mg/L (90 percentile)</li> </ul> <p>Zinc</p> <ul style="list-style-type: none"> <li>• 0.015 mg/L (90 percentile)</li> </ul> <p>Cadmium</p> <ul style="list-style-type: none"> <li>• 0.0055 mg/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

<b>MICROBIOLOGICAL</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for microbiological</b>	<b>WQIP performance indicators</b>
<p>Urban stormwater runoff typically can contain large numbers of faecal micro-organisms, used for many years as an indicator of the potential presence of pathogens. As a result, there is:</p> <ul style="list-style-type: none"> <li>the potential for adverse effects on direct contact (eg swimming), passive recreation (eg boating) and from discharge, although depending on size these may be localised and transitory</li> <li>the potential for microbial contamination of food species, particularly shellfish, although at the present time there is a prohibition on the taking of shellfish for food in this area</li> <li>part of this segment, between the West Lakes outlet and North Arm, which is unsuitable for contact recreation because of the conflict with other uses, eg shipping and the historical condition of some of the waterways (rubble, glass, etc)</li> </ul>	<p><b>Primary contact recreation:</b></p> <p>Enterococci</p> <ul style="list-style-type: none"> <li>&lt;200 orgs/100 mL (95 percentile)</li> </ul> <p>The 95 percentile allows for the objective value to be exceeded for 5% of the time which may occur, for example, for short periods following rainfall events causing stormwater discharges, particularly in the vicinity of the discharge points. For this reason the SA Health Commission has signage advising against contact recreation (bathing, swimming) in the vicinity when the water is coloured, which usually occurs with stormwater outflows.</p>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> <li>there is no contamination of human food species</li> </ul>

<b>ORGANICS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for organics</b>	<b>WQIP performance indicators</b>
<p>There is no data for waters, however data for sediments would suggest contamination is episodic and localised. Traces of PCBs were found in North Arm Creek and traces of organotins found at a number of locations in sediments. Other organics examined, including herbicides and organochlorins, were not detected or below the limits of detection. Contamination by organics should be prevented because of:</p> <ul style="list-style-type: none"> <li>• the potential for sub-lethal or lethal effects on biota</li> <li>• the potential for bio-concentration, bio-accumulation and bio-magnification</li> <li>• the potential to affect safety or tainting of fish and shellfish for human consumption.</li> </ul>	<p>In waterways, all organic compounds listed in Table 3.4.1 in ANZECC (2000) should be below detection, except for:</p> <ul style="list-style-type: none"> <li>• Oils and petroleum hydrocarbons &lt;1 mg/L (95 percentile)</li> </ul> <p>In stormwater/discharges, all organic compounds listed in Table 3.4.1 in ANZECC (2000) should meet the criteria for the 95% level of protection identified in the table.</p>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

**CENTRAL BARKER INLET Section (Zone 3 on Part A, Figure 1)****NUTRIENTS**

<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for nutrients</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>• <i>Ulva</i> proliferation</li> <li>• occasional fish kills</li> <li>• odours from decaying algae</li> <li>• low oxygen conditions and potential remobilisation of pollutants from sediments</li> <li>• high nutrient concentrations</li> <li>• mangrove and seagrass loss</li> </ul>	<p>Chlorophyll 'a'</p> <ul style="list-style-type: none"> <li>• 1 ug/L</li> </ul> <p>Phosphorus</p> <ul style="list-style-type: none"> <li>• Total 25 ug/L</li> <li>• FRP 10 ug/L</li> </ul> <p>Nitrogen</p> <ul style="list-style-type: none"> <li>• Total N 250 ug/L</li> <li>• Nitrate and Nitrate N 5 ug/L</li> <li>• Ammonia N 10 ug/L</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Ulva</i> growth substantially reduced (by at least 60%)</li> <li>• no further seagrass loss</li> <li>• healthy mangrove recruitment</li> <li>• minimal or no odour from decaying algae</li> <li>• reduction in the occurrence and extent of low oxygen conditions</li> </ul>

PHYSICAL PARAMETERS		
Water quality issues—pollutant indicators	Water quality objectives for physical parameters	WQIP performance indicators
<p>Occasionally very high loads of suspended solids occur as a result of storm events, through turbulence, riverine inputs and stormwater inputs, resulting in:</p> <ul style="list-style-type: none"> <li>• direct effects on biota (abrasion, smothering, loss of visibility, etc)</li> <li>• transport mechanism for toxicants and nutrients.</li> </ul> <p>Increased turbidity and colour (coloured dissolved organic matter) affecting:</p> <ul style="list-style-type: none"> <li>• reduction in light penetration and photosynthesis.</li> </ul>	<p><b>Ambient concentrations objectives:</b></p> <p>Suspended solids</p> <ul style="list-style-type: none"> <li>• &lt;3 mg/L (90 percentile)</li> </ul> <p>Turbidity</p> <ul style="list-style-type: none"> <li>• &lt;1 NTU &gt;200 metres offshore (90 percentile)</li> </ul> <p>Colour</p> <ul style="list-style-type: none"> <li>• &lt;15 Hazen Units (90 percentile)</li> </ul> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur, for example, for short periods following larger rainfall events or storms.</p> <p>Dissolved Oxygen</p> <ul style="list-style-type: none"> <li>• &gt;6 mg/L or 100% saturation during daytime monitoring, During neap tides in summer &gt;25% minimum saturation at any time over a 24 hrs diurnal cycle</li> </ul> <p>Temperature &lt; 2<sup>o</sup> over normal seasonal range,</p> <ul style="list-style-type: none"> <li>• pH Between 7.5–8.5</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

<b>METALS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for metals</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>Concentrations of copper and zinc are elevated.</li> </ul>	<p><b>Ambient concentration objectives (99% level of protection):</b></p> <p>Copper</p> <ul style="list-style-type: none"> <li>0.0003 mg/L (90 percentile)</li> </ul> <p>Lead</p> <ul style="list-style-type: none"> <li>0.0022 mg/L (90 percentile)</li> </ul> <p>Zinc</p> <ul style="list-style-type: none"> <li>0.007 mg/L (90 percentile)</li> </ul> <p>Cadmium</p> <ul style="list-style-type: none"> <li>0.0055 mg/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>

<b>MICROBIOLOGICAL</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for microbiological</b>	<b>WQIP performance indicators</b>
<p>Urban stormwater runoff typically can contain large numbers of faecal micro-organisms, used for many years as an indicator of the potential presence of pathogens. As a result, there is:</p> <ul style="list-style-type: none"> <li>the potential for adverse effects on direct contact (eg swimming) and passive recreation (eg boating), from discharge, although depending on size these may be localised and transitory</li> <li>the potential for microbial contamination of food species, particularly shellfish.</li> </ul>	<p><b>Primary contact recreation:</b> Enterococci</p> <ul style="list-style-type: none"> <li>&lt;200 orgs/100 mL (95 percentile)</li> </ul> <p>The 95 percentile allows for the objective value to be exceeded for 5% of the time, which may occur, for example, for short periods following rainfall events causing stormwater discharges, particularly in the vicinity of the discharge points. For this reason the SA Health Commission has signage advising against contact recreation (bathing, swimming) in the vicinity when the water is coloured, which usually occurs with stormwater outflows.</p> <p><b>Shellfishing</b> Faecal (thermotolerant) coliforms</p> <ul style="list-style-type: none"> <li>median not exceeding 14 MPN orgs/100 mL, with no more than 10% of the samples exceeding 43 MPN/100 mL.</li> </ul> <p>Note that the standard for North Arm to Section Bank is currently under review</p>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> <li>there is no contamination of human food species</li> </ul>
<b>ORGANICS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for organics</b>	<b>WQIP performance indicators</b>
<p>Although at present there is no information to indicate that there is currently any major concern, there remains:</p> <ul style="list-style-type: none"> <li>the potential for sub-lethal or lethal effects on biota</li> <li>the potential for bio-concentration, bio-accumulation and bio-magnification</li> <li>the potential to affect safety or tainting of fish and shellfish for human consumption.</li> </ul>	<p>In waterways, all organic compounds listed in Table 3.4.1 in ANZECC (2000) should be below detection, except for:</p> <p>Oils and petroleum hydrocarbons</p> <ul style="list-style-type: none"> <li>&lt;1 mg/L (95 percentile)</li> </ul> <p>In stormwater/discharges, all organic compounds listed in Table 3.4.1 in ANZECC (2000) should meet the criteria for the 95% level of protection identified in the table.</p>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>

**NORTHERN BARKER INLET (Zone 2 on Part A, Figure 1)****NUTRIENTS**

<b>Water quality issues—Pollutant indicators</b>	<b>Water quality objectives for nutrients</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>• <i>Ulva</i> proliferation</li> <li>• high nutrient concentrations</li> <li>• mangrove and seagrass loss</li> </ul>	<p>Chlorophyll 'a'</p> <ul style="list-style-type: none"> <li>• 1 ug/L</li> </ul> <p>Phosphorus</p> <ul style="list-style-type: none"> <li>• Total 25 ug/L</li> <li>• FRP 10 ug/L</li> </ul> <p>Nitrogen</p> <ul style="list-style-type: none"> <li>• Total N 250 ug/L</li> <li>• Nitrate and Nitrate N 5 ug/L</li> <li>• Ammonia N 10 ug/L</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Ulva</i> growth substantially reduced (by at least 60%)</li> <li>• no further seagrass loss</li> <li>• healthy mangrove recruitment</li> </ul>

PHYSICAL PARAMETERS		
Water quality issues—pollutant indicators	Water quality objectives for physical parameters	WQIP performance indicators
<p>Occasionally very high loads of suspended solids occur as a result of storm events, through turbulence, riverine inputs and stormwater inputs, resulting in:</p> <ul style="list-style-type: none"> <li>• direct effects on biota (abrasion, smothering, loss of visibility, etc)</li> <li>• transport mechanism for toxicants and nutrients.</li> </ul> <p>Increased turbidity and colour (coloured dissolved organic matter) affecting:</p> <ul style="list-style-type: none"> <li>• reduction in light penetration and photosynthesis.</li> </ul>	<p><b>Ambient concentrations objectives:</b></p> <p>Suspended solid</p> <ul style="list-style-type: none"> <li>• &lt;3 mg/ (90 percentile)</li> </ul> <p>Turbidity</p> <ul style="list-style-type: none"> <li>• &lt;1 NTU &gt;200 metres offshore (90 percentile)</li> </ul> <p>Colour</p> <ul style="list-style-type: none"> <li>• &lt;15 Hazen Units (90 percentile)</li> </ul> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur, for example, for short periods following larger rainfall events or storms.</p> <p>Dissolved Oxygen</p> <ul style="list-style-type: none"> <li>• &gt;6 mg/L or 100% saturation during daytime monitoring</li> </ul> <p>Temperature</p> <ul style="list-style-type: none"> <li>• &lt; 2<sup>0</sup> over normal seasonal range</li> </ul> <p>pH</p> <ul style="list-style-type: none"> <li>• Between 7.5–8.5</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

<b>METALS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for metals</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>Concentrations of copper and zinc are elevated.</li> </ul>	<p><b>Ambient concentration objectives (99% level of protection):</b></p> <p>Copper</p> <ul style="list-style-type: none"> <li>0.0003 mg/L (90 percentile)</li> </ul> <p>Lead</p> <ul style="list-style-type: none"> <li>0.0022 mg/L (90 percentile)</li> </ul> <p>Zinc</p> <ul style="list-style-type: none"> <li>0.007 mg/L (90 percentile)</li> </ul> <p>Cadmium</p> <ul style="list-style-type: none"> <li>0.0055 mg/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>
<b>MICROBIOLOGICAL</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for microbiological</b>	<b>WQIP performance indicators</b>
<p>Urban stormwater runoff typically can contain large numbers of faecal micro-organisms, used for many years as an indicator of the potential presence of pathogens. As a result, there is:</p> <ul style="list-style-type: none"> <li>the potential for adverse effects on direct contact (eg swimming) and passive recreation (eg boating), from discharge, although depending on size these may be localised and transitory.</li> <li>the potential for microbial contamination of food species, particularly shellfish.</li> </ul>	<p><b>Primary contact recreation:</b></p> <p>Enterococci</p> <ul style="list-style-type: none"> <li>&lt;200 orgs/100 mL (95 percentile)</li> </ul> <p>The 95 percentile allows for the objective value to be exceeded for 5% of the time which may occur, for example, for short periods following rainfall events causing stormwater discharges, particularly in the vicinity of the discharge points. For this reason the SA Health Commission has signage advising against contact recreation (bathing, swimming) in the vicinity when the water is coloured, which usually occurs with stormwater outflows.</p> <p><b>Shellfishing</b></p> <p>Faecal (thermotolerant) coliforms</p> <ul style="list-style-type: none"> <li>median not exceeding 14 MPN orgs/100 mL, with no more than 10% of the samples exceeding 43 MPN/100 mL.</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> <li>there is no contamination of human food species</li> </ul>

<b>ORGANICS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for organics</b>	<b>WQIP performance indicators</b>
<ul style="list-style-type: none"> <li>There is no data but contamination in this area is unlikely.</li> </ul>	<p>In waterways, all organic compounds listed in Table 3.4.1 in ANZECC (2000) should be below detection, except for:</p> <p>Oils and petroleum hydrocarbons</p> <ul style="list-style-type: none"> <li>&lt;1 mg/L (95 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>

**METROPOLITAN COASTAL WATERS**
**SECTION 1 NORTHERN–NEARSHORE (Zone 1 on Part A, Figure 1)**
**NUTRIENTS**

Water quality issues—Pollutant indicators	Water quality objectives for microbiological	WQIP performance indicators
<ul style="list-style-type: none"> <li>• high nutrient concentrations</li> <li>• mangrove and seagrass loss</li> </ul>	<p><b>Ambient Concentration objectives:</b></p> <p>Chlorophyll 'a'</p> <ul style="list-style-type: none"> <li>• 1 ug/L (90 percentile)</li> </ul> <p>Phosphorus</p> <ul style="list-style-type: none"> <li>• Total &lt;25 ug/L (90 percentile)</li> <li>• FRP &lt;10 ug/L (90 percentile)</li> </ul> <p>Nitrogen</p> <ul style="list-style-type: none"> <li>• Total N &lt;250 ug/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• no further seagrass loss</li> <li>• healthy mangrove recruitment</li> </ul>

PHYSICAL PARAMETERS		
Water quality issues—Pollutant indicators	Water quality objectives for physical parameters	WQIP performance indicators
<p>Increased turbidity and colour (coloured dissolved organic matter ), affecting:</p> <ul style="list-style-type: none"> <li>reduction in light penetration affecting photosynthesis.</li> </ul>	<p><b>Ambient concentration objectives:</b></p> <p>Suspended solids</p> <ul style="list-style-type: none"> <li>&lt;3 mg/L (90 percentile)</li> </ul> <p>Turbidity</p> <ul style="list-style-type: none"> <li>&lt;1 NTU &gt;200 metres offshore (90 percentile)</li> </ul> <p>Colour</p> <ul style="list-style-type: none"> <li>&lt;15 Hazen Units (90 percentile)</li> </ul> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur for example, for short periods following larger rainfall events or storms.</p> <p>Dissolved Oxygen</p> <ul style="list-style-type: none"> <li>100% saturation during daytime monitoring</li> </ul> <p>Temperature</p> <ul style="list-style-type: none"> <li>&lt; 2<sup>0</sup> over normal seasonal range</li> </ul> <p>pH</p> <ul style="list-style-type: none"> <li>Between 7.5–8.5</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>

<b>METALS</b>		
<b>Water quality issues—Pollutant indicators</b>	<b>Water quality objectives for metals</b>	<b>WQIP performance indicators</b>
	<p><b>Ambient concentration objectives (99% Level of Protection):</b></p> <p>Copper</p> <ul style="list-style-type: none"> <li>• 0.0003 mg/L (90 percentile)</li> </ul> <p>Lead</p> <ul style="list-style-type: none"> <li>• 0.0022 mg/L (90 percentile)</li> </ul> <p>Zinc</p> <ul style="list-style-type: none"> <li>• 0.007 mg/L (90 percentile)</li> </ul> <p>Cadmium</p> <ul style="list-style-type: none"> <li>• 0.0055 mg/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>
<b>MICROBIOLOGICAL</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for microbiological</b>	<b>WQIP performance indicators</b>
	<p><b>Primary contact recreation:</b></p> <p>Enterococci</p> <ul style="list-style-type: none"> <li>• &lt;200 orgs/100 mL (95 percentile)</li> </ul> <p>The 95 percentile allows for the objective value to be exceeded for 5% of the time, which may occur, for example, for short periods following rainfall events causing stormwater discharges, particularly in the vicinity of the discharge points. For this reason the SA Health Commission has signage advising against contact recreation (bathing, swimming) in the vicinity when the water is coloured, which usually occurs with stormwater outflows.</p> <p><b>Shellfishing</b></p> <p>Faecal (thermotolerant) coliforms</p> <ul style="list-style-type: none"> <li>• median not exceeding 14 MPN orgs/100 mL, with no more than 10% of the samples exceeding 43 MPN/100 mL.</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> <li>• there is no contamination of human food species</li> </ul>

<b>ORGANICS</b>		
<b>Water quality issues—Pollutant indicators</b>	<b>Water quality objectives for organics</b>	<b>WQIP performance indicators</b>
	<p>All organic compounds listed in Table 3.4.1 in ANZECC (2000) should be below detection, except for:</p> <p>Oils and petroleum hydrocarbons</p> <ul style="list-style-type: none"> <li>• &lt;1 mg/L (95 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>

METROPOLITAN COASTAL WATERS		
ZONES 5 AND 6		
NUTRIENTS		
Water quality issues—pollutant indicators	Water quality objectives for nutrients	WQIP performance indicators
<ul style="list-style-type: none"> <li>• high nutrient concentrations</li> <li>• mangrove and seagrass loss</li> </ul>	<p><b>Ambient concentration objectives:</b></p> <p>Chlorophyll 'a'</p> <ul style="list-style-type: none"> <li>• 1 ug/L (90 percentile)</li> </ul> <p>Phosphorus</p> <ul style="list-style-type: none"> <li>• Total &lt;25 ug/L (90 percentile)</li> <li>• FRP &lt;10 ug/L (90 percentile)</li> </ul> <p>Nitrogen</p> <ul style="list-style-type: none"> <li>• Total N &lt;250 ug/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• no further seagrass loss</li> <li>• healthy mangrove recruitment</li> </ul>

PHYSICAL PARAMETERS		
Water quality issues—pollutant indicators	Water quality objectives for physical parameters	WQIP performance indicators
<p>Increased turbidity and colour (coloured dissolved organic matter) affecting:</p> <ul style="list-style-type: none"> <li>reduction in light penetration affecting photosynthesis.</li> </ul>	<p><b>Ambient concentration objectives:</b></p> <p>Suspended solids</p> <ul style="list-style-type: none"> <li>&lt;2 mg/L (90 percentile)</li> </ul> <p>Turbidity</p> <ul style="list-style-type: none"> <li>&lt;2 NTU (90 percentile)</li> </ul> <p>Colour</p> <ul style="list-style-type: none"> <li>&lt;15 Hazen Units (90 percentile)</li> </ul> <p>The 90 percentile allows for the objective values to be exceeded for 10% of the time, which may occur, for example, for short periods following larger rainfall events or storms.</p> <p>Dissolved Oxygen</p> <ul style="list-style-type: none"> <li>100% saturation during daytime monitoring</li> </ul> <p>Temperature</p> <ul style="list-style-type: none"> <li>&lt; 2<sup>0</sup> over normal seasonal range</li> </ul> <p>pH</p> <ul style="list-style-type: none"> <li>Between 7.5–8.5</li> </ul>	<ul style="list-style-type: none"> <li>ambient water quality objectives achieved</li> </ul>

<b>METALS</b>		
<b>Water quality issues—Pollutant indicators</b>	<b>Water quality objectives for metals</b>	<b>WQIP performance indicators</b>
	<p><b>Ambient concentration objectives (99% level of protection):</b></p> <p>Copper</p> <ul style="list-style-type: none"> <li>• 0.0003 mg/L (90 percentile)</li> </ul> <p>Lead</p> <ul style="list-style-type: none"> <li>• 0.0022 mg/L (90 percentile)</li> </ul> <p>Zinc</p> <ul style="list-style-type: none"> <li>• 0.007 mg/L (90 percentile)</li> </ul> <p>Cadmium</p> <ul style="list-style-type: none"> <li>• 0.0055 mg/L (90 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>
<b>MICROBIOLOGICAL</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for microbiological</b>	<b>WQIP performance indicators</b>
	<p><b>Primary contact recreation:</b></p> <p>Enterococci</p> <ul style="list-style-type: none"> <li>• &lt;200 orgs/100 mL (95 percentile)</li> </ul> <p>The 95 percentile allows for the objective value to be exceeded for 5% of the time, which may occur, for example, for short periods following rainfall events causing stormwater discharges, particularly in the vicinity of the discharge points. For this reason the SA Health Commission has signage advising against contact recreation (bathing, swimming) in the vicinity when the water is coloured, which usually occurs with stormwater outflows.</p> <p><b>Shellfishing</b></p> <p>Faecal (thermotolerant) coliforms</p> <ul style="list-style-type: none"> <li>• median not exceeding 14 MPN orgs/100 mL, with no more than 10% of the samples exceeding 43 MPN/100 mL.</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> <li>• there is no contamination of human food species</li> </ul>

<b>ORGANICS</b>		
<b>Water quality issues—pollutant indicators</b>	<b>Water quality objectives for organics</b>	<b>WQIP performance indicators</b>
	<p>All organic compounds listed in Table 3.4.1 in ANZECC (2000) should be below detection, except for:</p> <p>Oils and petroleum hydrocarbons</p> <ul style="list-style-type: none"> <li>• &lt;1 mg/L (95 percentile)</li> </ul>	<ul style="list-style-type: none"> <li>• ambient water quality objectives achieved</li> </ul>